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HISTORICAL FUTURES

"STARING INTO THE SINGULARITY" AND OTHER POSTHUMAN TALES: TRANSHUMANIST STORIES OF FUTURE CHANGE

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ABSTRACT

In this article, I conduct a contextual analysis of transhumanist conceptions of posthuman futures. Focusing on cryonics, nanotechnology, and artificial superintelligence technological projects through a study of primarily American sources from the 1960s onward, I identify three distinct conceptualizations of the posthuman future: Promethean, spontaneous, and scalar. I argue that transhumanists envision posthumanity as resulting from a transition that involves both continuity and radical change. Although these three posthuman futures appear to share an interest in predicting a superior "cosmic" realization of human destiny, they involve distinct "liberal" conceptions of historical agency. These include the unlimited individual liberty of the technologized self, the knowledge-ordering properties of the market, and the rational aggregation of individual interests over the long term. I locate these heterogeneous and partly conflicting conceptions of historical agency in the context of the postwar crisis and remaking of liberalism's future. I argue that transhumanist ideas about the transition toward a *more-than-human* or *beyond-human* future are best understood as manifesting a wide range of attempts at thinking about horizons of unprecedented change within the terms of postwar liberal projects. Ultimately, transhumanist futures shed light on the multiplicity of political temporalities that are required for thinking and writing stories about unprecedented futures.

Keywords: humanity, posthumanity, transhumanism, cosmic futures, connective and disconnective futures

> The Singularity may be counterintuitive to you, but you grew up in Real Life, where the Laws are constant and things change over decades. To me, Transcension is homey and familiar, the logical conclusion of one of the realities I grew up in.
> — Eliezer S. Yudkowsky, "Singularity: Generation Gap"[2]

"Nothing is quite so dead today as the spirit of optimism that the very word Enlightenment evokes."[3] Thus the philosopher Judith N. Shklar introduced her

1. Open Access funding enabled and organized by ProjektDEAL.

2. Eliezer S. Yudkowsky, "Singularity: Generation Gap," Extropians, 24 September 1997, accessed 25 February 2021, http://extropians.weidai.com/extropians.3Q97/4352.html.

3. Judith N. Shklar, *After Utopia: The Decline of Political Faith* (1957; repr. Princeton: Princeton University Press, 2020), 3.

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1957 book, *After Utopia: The Decline of Political Faith*. The book was not a critique of utopianism but a rather gloomy examination of the postwar ideological landscape, which Shklar understood as having been marked by the erosion of socialist and liberal projects and the domination of romantic fatalism. For Shklar, the end of liberal faith did not condemn political imagination as irrelevant but emphasized the importance of distinguishing between useful hope and unrealistic utopia, a distinction that she took to be of practical concern for all political philosophies.[4] In a later essay, Shklar noted that American author Nathaniel Hawthorne, whom she believed was a key reformist thinker, reminded readers that, "however utopian a community thinks itself, it still must begin by building a prison and a graveyard."[5] For Hawthorne, and it seems for Shklar as well, reformism required a balanced view of history, one that acknowledged the excesses not only of utopia but also of tradition in the past (and likely in the future as well). No reformist project could escape the bounds of human nature.

As Samuel Moyn has pointed out in his foreword to the latest edition of *After Utopia*, "it turns out that 'after utopia' is a familiar place in which to find ourselves."[6] The current moment and the postwar years share not only a sense of ideological exhaustion but also the feeling that political theory has reached an impasse. Recent historiography and political theory have widely discussed this sentiment that possible futures have eroded. The concept of the Anthropocene in particular seems to suggest a dramatic and unprecedented extension of historicity into deep and nonhuman pasts and futures.[7] Zoltán Boldizsár Simon and Marek Tamm have proposed that the current predicament expresses a new Western historical sensibility, manifest in the emergence of previously unimaginable futures.[8] This emerging historical sensibility, they have argued, is evident in contemporary transhumanist ideas about a future posthumanity: posthuman futures are "disconnective" in the sense that they no longer relate present experiences and future prospects to past forms of intelligibility.[9]

This article discusses ideas about the posthuman future within Anglophone transhumanism in the late twentieth and twenty-first centuries through the prism of their conceptualizations of change and continuity. From the 1960s onward, and primarily in the United States and Western Europe, transhumanists have envisioned a future without graveyards, and sometimes without prisons. Yet most

4. Recent interest in Shklar's work has extended beyond her alleged theorizing of dystopic liberalism. See especially Katrina Forrester, "Hope and Memory in the Thought of Judith Shklar," *Modern Intellectual History* 8, no. 3 (2011), 591-620.

5. Judith N. Shklar, "An Education for America: Tocqueville, Hawthorne, Emerson," in *Redeeming American Political Thought*, ed. Stanley Hoffmann and Dennis F. Thompson (Chicago: University of Chicago Press, 1998), 72, quoted in Forrester, "Hope and Memory in the Thought of Judith Shklar," 603.

6. Samuel Moyn, foreword to Shklar, *After Utopia*, xv.

7. Among a vast literature, see Christophe Bonneuil and Jean-Baptiste Fressoz, *The Shock of the Anthropocene* (London: Verso, 2016); Donna J. Haraway, *Staying with the Trouble: Making Kin in the Chthulucene* (Durham: Duke University Press, 2016); Duncan Kelly, *Politics and the Anthropocene* (Cambridge, UK: Polity Press, 2019).

8. Zoltán Boldizsár Simon and Marek Tamm, "Historical Futures," *History and Theory* 60, no. 1 (2021), 3-22.

9. Simon and Tamm, "Historical Futures," 7. See also Zoltán Boldizsár Simon, *History in Times of Unprecedented Change: A Theory for the 21st Century* (London: Bloomsbury Academic, 2019).

of the time they would not call their project utopian. Transhumanists advocate the possibility and desirability of posthumanity: they claim that fundamental changes in human biology and society will be brought about not only through education and scientific knowledge but also by more controversial methods of chemical or genetic manipulation, human-machine hybridization, and the development of superintelligent machines. According to Nick Bostrom, "transhumanists hope that by responsible use of science, technology, and other rational means we shall eventually manage to become posthuman, beings with vastly greater capacities than present human beings have."[10] In this sense, "transhumanism has roots in secular humanist thinking, yet is more radical" in its attempts "to overcome some of our basic biological limits," such as mortality or aging.[11]

The now-burgeoning literature on transhumanism sheds light on the wide range of transhumanist projects, which (in their own terms) involve *more-than-human* and *posthuman* futures, visions of radical change and technological forecasting, projects about individual survival, and claims of global emancipation.[12] Scholars in the fields of critical theory, literary theory, and geography have contrasted the posthuman's emancipatory potential as a critical tool for undermining the perceived universality and homogeneity of the category of human, which is in fact a historically situated, gendered, and racialized notion, with what they understand as transhumanism's reductionist and literal approach to posthumanity.[13] From these perspectives, transhumanism is best understood as a form of "technoliberalism" that exacerbates contemporary dynamics of control, discipline, and extraction.[14] At the same time, scholars in science and technology studies and religious studies have discussed how transhumanism hybridizes conventional conceptions of the utopian, the religious, and the secular in a characteristically postmodern way.[15] Transhumanism, in this sense, expresses "the Zeitgeist of our technological age."[16] It is also noteworthy that most transhumanists have understood their

10. Nick Bostrom, "Transhumanist Values," in "Ethical Issues for the Twenty-First Century," supplement, *Journal of Philosophical Research* 30 (2005), 4.

11. Ibid.

12. Scholarship on transhumanism includes *Post- and Transhumanism: An Introduction*, ed. Robert Ranisch and Stefan Lorenz Sorgner (Frankfurt: Peter Lang, 2014); *Perfecting Human Futures: Transhuman Visions and Technological Imaginations*, ed. J. Benjamin Hurlbut and Hava Tirosh-Samuelson (Wiesbaden: Springer VS, 2016); Gilbert Hottois, *Philosophie et idéologies trans/posthumanistes* (Paris: Vrin, 2017); Benjamin Bourcier, "Les théories politiques du transhumanisme," *Raisons politiques* 74, no. 2 (2019), 5-12.

13. See, for example, Neil Badmington, "Theorizing Posthumanism," *Cultural Critique* 53, no. 1 (2003), 10-27; Cary Wolfe, *What Is Posthumanism?* (Minneapolis: University of Minnesota Press, 2009), xiii-xv; Rosi Braidotti, *The Posthuman* (Cambridge, UK: Polity Press, 2013). For a reflection on the relationship between transhumanism and posthumanism, see Zoltán Boldizsár Simon, "Two Cultures of the Posthuman Futures," *History and Theory* 58, no. 2 (2019), 171-84.

14. Rosi Braidotti, "A Theoretical Framework for the Critical Posthumanities," *Theory, Culture & Society* 35, no. 6 (2019), 48. On the notion of technoliberalism, see Neda Atanasoski and Kalindi Vora, *Surrogate Humanity: Race, Robots, and the Politics of Technological Futures* (Durham, NC: Duke University Press, 2019), 4, 13.

15. See especially Nasser Zakariya, "Scientific Humanisms and Technological Utopias: Situating the Transhumanist Imagination," in Hurlbut and Tirosh-Samuelson, *Perfecting Human Futures*, 286. See also Syed Mustafa Ali, "'White Crisis' and/as 'Existential Risk,' or the Entangled Apocalypticism of Artificial Intelligence," *Zygon* 54, no. 1 (2019), 207-24.

16. Hava Tirosh-Samuelson, "In Pursuit of Perfection: The Misguided Transhumanist Vision," *Theology and Science* 16, no. 2 (2018), 204.

project as either fundamentally antipolitical or theoretically compatible with a wide variety of political stances.[17]

In this article, I define transhumanism as a space of discourse and technological practices that entail the projection and advocacy of posthuman futures. I argue that transhumanist ideas of transition toward a *more-than-human* or *beyond-human* future are best understood as manifesting the wide range of postwar liberal projects, including distinct possibilities for thinking about horizons of unprecedented change. I conduct a contextual analysis of self-defined transhumanist conceptions of change, focusing primarily on American transhumanist writings published between the 1960s and the present. I discuss how transhumanists have understood horizons of unprecedented change as holding onto a strong and reassuring connection between the present and the future, and I show how they have done so by making intersecting claims about unknowability and forms of anticipatory knowledge. In other words, this article discusses the various ways in which posthuman futures have been crafted as both *connective* and *disconnective*. I leave aside the theoretical question of whether stories about posthuman futures signal an actual change in the regime of historicity or whether they should be understood as the outburst of a now-obsolete mode of experiencing time.[18] At various points in this article, however, I examine the sort of history that such visions of the future have entailed for transhumanists themselves. In this way, I contribute to the political history and ideological analysis of contemporary visions of epochal change.

In the first section, I introduce three conceptualizations of the posthuman future, each of which is tied to a specific technological project: the *Promethean future* of cryonics, the *spontaneous future* of nanotechnology, and the *scalar future* of superintelligence. In the second section, I explain how these conceptualizations are meant to ensure continuity in times of radical change. The third section discusses the various ways in which transhumanists have attempted to anticipate a superior "cosmic" realization—a posthuman future partly beyond grasp, yet foretold in various ways. I claim in the fourth section that transhumanism also involves highly heterogeneous political ideas about unprecedented change that are best understood in light of the postwar crisis and remaking of liberal conceptions of the future. Transhumanist futures, I conclude, shed light on the multiplicity of political temporalities that are required for thinking and writing stories about unprecedented futures.

THREE STORIES OF THE POSTHUMAN FUTURE

The Promethean Future of Cryonics

Under the category of "Promethean future," I gather transhumanist discourse that values individual choice, exploration of the self, and personal immortality. This

17. For an overview, see Tamar Sharon, *Human Nature in an Age of Biotechnology: The Case for Mediated Posthumanism* (Dordrecht: Springer Netherlands, 2014), 17-56.

18. On this topic, see Helge Jordheim, "Introduction: Multiple Times and the Work of Synchronization," *History and Theory* 53, no. 4 (2014), 498-518; *Rethinking Historical Time: New Approaches to Presentism*, ed. Marek Tamm and Laurent Olivier (London: Bloomsbury Academic, 2019); Simon, *History in Times of Unprecedented Change*.

is particularly true for the field of cryonics, which was inspired by mid-twentieth century cryobiology and science fiction. Cryonics entails a set of techniques for conserving and preserving the dead; the goal is that most of the damage that currently appears irreparable will be able to be healed in the future.[19] Although cryonicists have not always gotten along, they have generally agreed that the idea of physical immortality is "the most profound and powerful idea in history."[20] According to cryonicist Robert C. W. Ettinger, the possibility of successfully reanimating humans after cryonic suspension would create "a discontinuity in history, with mortality and humanity on one side—on the other immortality and transhumanity."[21] At the same time, for Ettinger, cryonics promised "a bridge to an anticipated Golden Age" and "strengthened feeling of the unity of mankind."[22] As cryonicists have insisted, such attempts to revive the dead were not new, and they were susceptible to changes in social norms of well-being and biological knowledge.[23] "Suspended death," in Ettinger's terms, would be merely one among many other existing and potential longevity technologies that seek to conserve life and extend it into a hitherto inaccessible, but nonetheless fathomable, realm of time.[24] In the 1960s, scenarios of cryonics resuscitation typically entailed a qualitative, categorical leap into a potentially remote future, when techniques for securing immortality would not only be available but would also ensure that some form of personal identity could be maintained in the process. In other words, these scenarios often implied that the future would be at once very different from and quite similar to the present (at least from the viewpoint of the cryopreserved individual), for otherwise the prospect of immortality would be too frightening.

Two decades later, cryonics remained an extremely marginal practice: to cryonicists' dismay, *many were called, but few were frozen*.[25] In the 1980s and 1990s, cryonics also illustrated the integration of transhumanism within libertarianism, as cryonicists increasingly justified their unique views by referring to the novels and objectivist philosophy of Russian émigré novelist Ayn Rand. According to cryonicists, the choice to be cryonically preserved was rooted in rational selfishness. As the president of a cryonics organization explained, "it has

19. On cryonics, see Grant Shoffstall, "Freeze, Wait, Reanimate: Cryonic Suspension and Science Fiction," *Bulletin of Science, Technology & Society* 30, no. 4 (2010), 285-97; Tiffany Romain, "Extreme Life Extension: Investing in Cryonics for the Long, Long Term," *Medical Anthropology* 29, no. 2 (2010), 194-215; Jonny Bunning, "The Freezer Program: Value after Life," in *Cryopolitics: Frozen Life in a Melting World*, ed. Joanna Radin and Emma Kowal (Cambridge, MA: MIT Press, 2017), 215-43.

20. Saul Kent, "The First Cryonicist," *Cryonics* 32 (March 1983), 10. See also Michael Darwin, "Reflections on the Birth of Cryonics in Britain," *Cryonics* 7, no. 11 (1986), 22-25.

21. Robert C. W. Ettinger, "The Transhuman Condition," *Man into Superman* (Clinton, MI: Cryonics Institute, 1989), 5.

22. Robert C. W. Ettinger, *The Prospect of Immortality* (Garden City, NY: Doubleday, 1964), 82, 159.

23. Gerald J. Gruman, "A History of Ideas about the Prolongation of Life: The Evolution of Prolongevity Hypotheses to 1800," *Transactions of the American Philosophical Society* 56, no. 9 (1966), 1-102.

24. Ettinger, *The Prospect of Immortality*, 36.

25. This reference to the biblical verse "For many are called, but few are chosen" (Matthew 22:14) appeared frequently in cryonics writings. It was commonly used to express the unpopularity of cryonics or the heroic disposition of cryonicists.

been said that space is the final frontier. It is not. Expanding our own futures, extending our own lives, *that is the final frontier and the only truly endless one*. Cryonicists do not intend to shrink from that frontier. That is the true mark of a pioneer."[26] For Max More, a committed cryonicist and self-described "transhumanist philosopher," the individual quest for physical transformation was not a sin against nature but a humanizing transgression. This very transgression was now required from those with superior judgment, and this meant endorsing cryonics. As More envisioned it, a vanguard of selfish individuals would change the course of evolution by endorsing not only life extension techniques such as cryonics but also other self-transformation technologies that would eventually turn them into other-than-human beings in the biological sense.

Although cryonics ideas and practices have changed between the 1960s and today, many cryonicists across this period have subscribed to an understanding of organic progress that emphasizes advancement from lower to higher levels of complexity. Ettinger, for instance, claimed that humanity's current stage was "only a rung on the evolutionary ladder."[27] In More's view as well, humanity is best defined by its "drive towards complexity" and the overcoming of bodily, mental, and environmental limitations.[28] Cryonicists have described their belief in this particular form of human evolution as grounded in humanist ideals and the notion that humans can master their biological natures and environment through intellectual achievement. But in the technological context of the late twentieth century, they also argued that "humanism, while a step in the right direction, contains too many outdated values and ideas,"[29] including the notion that progress should (or could) be confined to "the merely human stage of evolution."[30] In particular, Max More emphasized the importance of individual choice in matters of "morphological, neurological, and genetic freedom," arguing that technology was the most promising means for overcoming the innate irrationality and violence in human nature.[31] According to More, transhumanists were "the torch-bearers of Nietzsche's radical program of reassessment and self-constitution" because they had reclaimed the right to change themselves at will.[32] Through what he called "self-transformation," transhumanists would overcome a flaw of the "übermenschean ideal": humanity could not risk losing what Nietzsche had called the "will to power" because of uncontrollable evolutionary forces.[33] This meant that biological evolution was a process that had to be tamed. As More wrote, "the ability to question everything, to hold up to the bright light of reason every supposition, assumption, and dogma, *requires more than just the will to do so*. We also require intelligent technology to assist

26. Michael Darwin, "The Omni Affair," *Cryonics* 7, no. 11 (1986), 9 (emphasis added).

27. Ettinger, *The Prospect of Immortality*, 74.

28. Max More, "On Becoming Posthuman," *Free Inquiry* 15, no. 4 (1994).

29. Max More, "Transhumanism: Towards a Futurist Philosophy," *Extropy* 6 (Summer 1990), 6.

30. Max More, "The Extropian Principles 2.5," *Aleph* (blog), July 1993, http://www.aleph.se/Trans/Cultural/Philosophy/princip.html.

31. Max More, "Technological Self-Transformation: Expanding Personal Extropy," *Extropy* 4, no. 2 (1993), 17.

32. Max More, "Editorial," *Extropy* 6, no. 1 (1994), 4.

33. More, "Editorial," 4; More, "Technological Self-Transformation," 15.

us in this Promethean task."[34] Humans would be able to overcome death—they would, in other words, be able to eliminate the tragic from human existence by making choices in the present. This captures the Promethean future of cryonics: by contesting the ultimate unquestionability of death, transhumanists (in their "posthuman" descent) would not be gods but rather humans who have broken free from their illusions and bodies, both of which being understood as fundamental limitations that cannot be overcome without first doing away with the "disease" of humanity altogether.[35]

The Spontaneous Future of Nanotechnology

The term "spontaneous future" denotes those instances of transhumanist discourse that have insisted on not only the self-ordering dynamics of technological and social change but also the value of an open future. Especially relevant in this respect is the notion of nanotechnology developed by K. Eric Drexler. A space and cryonics activist, Drexler helped popularize the concept of nanotechnology through his 1986 book titled *Engines of Creation*, which he wrote while working as a graduate student of Marvin Minsky at the MIT Media Lab.[36] Drexler described nanotechnology as an engineering method that was based on the manipulation of atoms and that would one day enable humanity to create inalterable objects and materials. Nanotechnology, in his view, would enable material abundance as well as potentially unlimited biological regeneration, which would be necessary for cryonic reanimation. Drexler claimed that the emergence of molecular engineering was an "almost inevitable" and "massive breakthrough," but he also noted that it was compatible with the laws of physics and the "deep-rooted principles of evolutionary change."[37] Future nanotechnology, he explained, would arise not from unpredictable scientific revolutions but from the convergence of various areas of technological progress. The changes resulting from this convergence would, in turn, subtly alter the world system's equilibrium, leading to positive-sum games and global cooperation.[38] For Drexler, scientific progress occured through an undirected, polycentric process, an idea he borrowed from Karl Popper, Michael Polanyi, and Friedrich A. Hayek.[39] In this view, future drastic changes would result from the cumulative effects of projects conducted independently according to a shared set of principles. For instance, in order to limit the proliferation of self-replicating nanoscale robots, the machines of the future could be engineered as "law-abiding citizens," a term

34. More, "Editorial," 4.

35. The idea of humanity as disease is developed especially in Ettinger, "The Deficiencies of Natural Man," *Man into Superman*, 15-23.

36. K. Eric Drexler, *Engines of Creation* (Garden City, NY: Anchor Press/Doubleday, 1986). See also Stewart Brand, *The Media Lab: Inventing the Future at MIT* (New York: Penguin Books, 1988), 226. On nanotechnology, see Bernadette Bensaude-Vincent, "Nanobots and Nanotubes: Two Alternative Biomimetic Paradigms of Nanotechnology," in *Genesis Redux: Essays in the History and Philosophy of Artificial Life*, ed. Jessica Riskin (Chicago: University of Chicago Press, 2007), 221-36.

37. Drexler, *Engines of Creation*, 20, 38.

38. Ibid, 83, 199.

39. See especially Mark S. Miller and K. Eric Drexler, "Markets and Computation: Agoric Open Systems," in *The Ecology of Computation*, ed. B. A. Huberman (Amsterdam: North Holland, 1988), 133-76.

meant to suggest that they would be as subject to the defining features of their design as they would be to the inalterable laws of physics.[40]

Drexler was what W. Patrick McCray has termed a "visioneer," an engineer of the Cold War years who opened horizons of ideological change through concrete technological practice.[41] According to McCray, advocating nanotechnology or space colonization was meant to refute the neo-Malthusian concerns that were pervasive during the 1970s. Nanotechnology would grow "the size of the future's promise" by fostering the material and ideological conditions needed to secure a future of unlimited "free space."[42] As Drexler explained, this "open" future would be fueled by the classical liberal economic idea that had also powered the Industrial Revolution: "that wealth springs from ideas, investment, production, and trade."[43] The posthuman future would be a liberal utopia in the sense that it would be a plural world, one with enough resources for all individuals to fulfill their life plans in satisfactory ways and without making anyone else worse off. This vision coalesced in a future state of the world that Drexler and others termed Paretotopia.[44] The notion of Paretotopia highlights the value of free choice, yet at the same time it points to a single reference point for optimizing individual material endowment and preferences.

Realizing the nanotechnology of the future, in Drexler's view, would require not only federal support but also a rational politics of knowledge. Instructed by space activism's failure to generate widespread political support, Drexler and other advocates of nanotechnology did not hope that technological progress would occur on its own. Instead, they claimed that it should be cultivated by society. This belief was not merely hollow rhetoric; rather, it represented a strong epistemological thesis that the rationality of decentralized knowledge was superior to that of central planning. Such rational knowledge institutions included the "science court," a courtlike procedure through which scientists would settle scientific controversies in order to provide sound empirical grounds for policymaking.[45] Another was the project of hypertext publishing, an indexing method that would enable the efficient sharing of information on computer networks.[46] Away from the cumbersome bureaucracy of government-controlled science, new knowledge environments

40. Drexler, *Engines of Creation*, 173. See also ibid., 147-57, 222.

41. W. Patrick McCray, *The Visioneers: How a Group of Elite Scientists Pursued Space Colonies, Nanotechnologies, and a Limitless Future* (Princeton: Princeton University Press, 2012).

42. K. Eric Drexler, "A Technology of Tiny Things: Nanotechnics and Civilization," *Whole Earth Review* 54 (Spring 1987), 12.

43. Ibid., 12-13.

44. The term "Paretotopia," although never formalized, was used by Drexler, Miller, and others from the 1980s onward. See K. Eric Drexler, "Reframing Superintelligence: Comprehensive AI Services as General Intelligence" (Technical Report #2019-1, Future of Humanity Institute, University of Oxford, 2019), 130, https://www.fhi.ox.ac.uk/wp-content/uploads/Reframing_Superintelligence_FHI-TR-2019-1.1-1.pdf.

45. Task Force of the Presidential Advisory Group on Anticipated Advances in Science and Technology, "The Science Court Experiment: An Interim Report," *Science* 193 (August 1976), 653-56. For contextualization and critique, see Dorothy Nelkin, "Thoughts on the Proposed Science Court," *Newsletter on Science, Technology & Human Values* 2, no. 1 (1977), 20-31.

46. Theodor H. Nelson, *Computer Lib/Dream Machines*, 2nd ed. (Redmond, WA: Tempus Books of Microsoft Press, 1987); K. Eric Drexler, "Hypertext Publishing and the Evolution of Knowledge," *Social Intelligence* 1, no. 2 (1991), 87-120.

would favor the "memes" of reason; scientific publics and communities could develop an "orderly way to bring about the facts."[47] In such spaces, new knowledge authorities would emerge in a decentralized fashion from the aggregation of manifold private exchanges. For instance, with hypertext and personal computers, individuals would be able to retrieve the whole knowledge "record of the race" according to their specific needs.[48] As Drexler and other "high-tech Hayekians" claimed, technoscientific progress would be realized through the most efficient social technology available for exchanging and ordering knowledge: a spontaneous market.[49] Just like in Hayek's conception of the market, however, this process would occur on the background of a continuity in culture and tradition. In the spontaneous future of nanotechnology, technoscientific progress—and thus the preservation of free choice—would depend on the emergence, transmission, and cultivation of scientific truth through self-ordering mechanisms.

The Scalar Future of Superintelligence

The "scalar future" encompasses ideas within literary and engineering writings produced between the 1980s and the present about future change involving the extension of present economic and moral value over large scales of space and time. The core idea of singularity, which was introduced by science fiction writer and computer scientist Vernor Vinge in 1987 and popularized by engineer Ray Kurzweil, is that trends of growth in computer capacity will continue to accelerate in the near future.[50] This would ultimately trigger an "intellectual runaway," an exponential growth in artificial intelligence (AI) leading to the development of superhuman intelligent machines capable of self-improvement, thereby causing unprecedented technological and social disruption.[51] According to singularity theorists, unprecedented and uncontrollable changes would lead to a point in history so different that all social norms would become obsolete. As Vinge explained, "when a race succeeds in making creatures that are smarter than it is, then all the rules are changed. And *from the standpoint of that race*, you've gone through a Singularity," by which he meant the obsolescence of current normative standards.[52] For this reason, Vinge claimed that adopting a strategy of "Drexlerian confinement" would not sufficiently contain the proliferation and power of self-improving machines.[53] Throughout the 2000s and 2010s, prolific transhumanist writers such as Bostrom

47. Drexler, *Engines of Creation*, 35, 208. The notion of a meme refers to small and easily replicable bits of information. See Richard Dawkins, *The Selfish Gene*, 3rd ed. (Oxford: Oxford University Press, 2006).

48. I borrow the phrase "record of the race" from Vannevar Bush's description of the memex, which was a key inspiration for hypertext programmers in the late 1980s, even though their projects differed considerably. See Vannevar Bush, "As We May Think," *The Atlantic*, July 1945, https://www.theatlantic.com/magazine/archive/1945/07/as-we-may-think/303881/.

49. Don Lavoie, Howard Baetjer, and William Tulloh, "High-Tech Hayekians: Some Possible Research Topics in the Economics of Computation," *Market Process* 8 (1990), 120-46.

50. Vernor Vinge, *True Names . . . and Other Dangers* (New York: Baen Books, 1987); Ray Kurzweil, *The Singularity Is Near: When Humans Transcend Biology* (New York: Viking, 2005).

51. Vernor Vinge, "The Technological Singularity" (presentation, Vision 21: Interdisciplinary Science and Engineering in the Era of Cyberspace, NASA Lewis Research Center, 1993), 14, https://ntrs.nasa.gov/search.jsp?R=19940022855.

52. Vernor Vinge, "Hurtling towards the Singularity," interview by Michael Synergy, *Mondo 2000* 7 (Fall 1989), 116 (emphasis added).

53. Vinge, "The Technological Singularity," 16.

and Eliezer Yudkowsky rejected the notion that a singularity event would necessarily be predictable.[54] In particular, Bostrom emphasized the value of mitigating potential "existential risks" resulting from future developments in nanotechnology or AI.[55] He argued that the technological disruption of existing social orders could and should be averted instead of passively embraced. In this view, the future of AI would not result from inescapable acceleration: reaching the preferred goal would require determining what constituted the possible features of a future world state and the possible pathways to realize it, and this could be done through the development of future AI scenarios. Judging which scenario is best and how to achieve it would require new forms of expertise about the moral features of AI systems as well as new frameworks for aggregating the preferences of all those affected by automated decisions—including all present and future beings.[56]

In recent years, problems of AI "control" and "safety" have raised concern and attention that extend well beyond the field of transhumanism.[57] In part, however, how AI researchers have defined such problems relates to transhumanist debates about the nature of the transition to a future era of machine intelligence.[58] These debates have occurred between advocates of *continuist* (slow takeoff) and *discontinuist* (fast takeoff) singularity hypotheses.[59] Whereas the slow takeoff hypothesis suggests that AI will cause processual change in the world, the fast takeoff scenario predicts the advent of a transformative event. In the former case, forms of human adaptation to change would likely occur; in the latter, the possibility of adaptation would be drastically limited. Supporters of the slow takeoff hypothesis have stated that AI would induce momentous but gradual changes that would be similar to the agricultural and industrial revolutions but on a larger scale. The fast takeoff hypothesis's defenders, including Yudkowsky and Bostrom, have implied that a machine "intelligence explosion" could occur instantaneously once AI systems have become more "generally" intelligent than their human designers.[60] As Bostrom has explained, this scenario is especially worrying because of the "orthogonality" of cognitive and moral capacity: if AI systems displayed superhuman levels of intelligence, they could

54. Nick Bostrom, "How Long before Superintelligence?" updated 28 August 2000, https://web.archive.org/web/20001210012600/https://www.nickbostrom.com/superintelligence.html; Eliezer Yudkowsky, "Three Major Singularity Schools," Machine Intelligence Research Institute, 30 September 2007, https://intelligence.org/2007/09/30/three-major-singularity-schools/.

55. Nick Bostrom, "Existential Risks: Analyzing Human Extinction Scenarios and Related Hazards," *Journal of Evolution and Technology* 9, no. 1 (2002).

56. Eliezer Yudkowsky, *Coherent Extrapolated Volution* (San Francisco: Singularity Institute, 2004); Nick Bostrom, *Superintelligence*: *Paths, Dangers, Strategies* (Oxford: Oxford University Press, 2014), 141, 212.

57. Stuart J. Russell, *Human Compatible: Artificial Intelligence and the Problem of Control* (New York: Viking, 2019); Sergey Brin, "2017 Founders' Letter," Alphabet, 2017, https://abc.xyz/investor/founders-letters/2017/index.html.

58. See, for instance, Dario Amodei, Chris Olah, Jacob Steinhardt, Paul Christiano, John Schulman, and Dan Mané, "Concrete Problems in AI Safety" (arXiv, uploaded 21 June 2016), https://arxiv.org/abs/1606.06565v1.

59. Robin Hanson and Eliezer Yudkowsky, *The Hanson-Yudkowsky AI-Foom Debate* (Berkeley: Machine Intelligence Research Institute, 2013). For a discussion of both scenarios, see Murray Shanahan, *The Technological Singularity* (Cambridge, MA: MIT Press, 2015).

60. Bostrom, *Superintelligence*, 62-77. The notion of artificial general intelligence suggests the possibility of future AI systems demonstrating a breadth of cognitive capacities similar to those of humans.

also cause human extinction for strictly evolutionary reasons.[61] Superintelligent machines would not care about continuing the existence of the human species unless they were explicitly taught to do so.

According to Bostrom and Yudkowsky, superintelligent AI promises to change humanity's destiny in unprecedented ways, yet this future would need to be actively shaped rather than passively anticipated. A key notion in this respect is that risk preparedness requires unprecedented forms of human and social engineering. For instance, Bostrom has suggested cognitive enhancement as one way to maximize the likelihood of an AI transition occurring at a manageable (that is, secure) pace.[62] As is rarely noted, the apparently radical visions of Vinge and Kurzweil also entail elements of continuity: intellectual property rights for the former, some form of morality for the latter. In Vinge's words, "the post-Singularity world *does* fit with the larger tradition of change and cooperation that started long ago (perhaps even before the rise of biological life)"; this means that "much of what we value (knowledge, memory, thought) need never be lost."[63] As Bostrom and a group of AI policy experts have argued, avoiding a disruptive AI scenario would require specific forms of global political regulation, such as averting the threat of a technology race between competing nation-states.[64] Thus, although AI promises to make an unprecedented kind of change in human history, it also imbues the posthuman horizon with what I have elsewhere referred to as a conservative inclination; indeed, long-term dangers posed by AI seem to justify urgent calls for risk mitigation that link the preservation of existing global orders with the furthering of humane values.[65] Safeguarding the future of innovation is a matter of changing the aims of AI from a scientific discipline concerned with problem-solving, efficiency, and accuracy "to a field concerned with systems that are provably beneficial *for humans*."[66] From this perspective, the scalar future of superintelligence opens up new realms of value and unprecedented possibilities for global coordination, the exploration of which would be essential for safely developing posthuman AI.

PATHWAYS TO UNPRECEDENTED CHANGE

As scholars have aptly noted, transhumanist futures profoundly challenge humanity's role as the central subject of history; at the same time, they do not appear

61. Bostrom, *Superintelligence*, 107. See also Stephen M. Omohundro, "The Basic AI Drives," *Artificial General Intelligence 2008: Proceedings of the First AGI Conference*, ed. Pei Wang, Ben Goertzel, and Stan Franklin (Amsterdam: ISO Press, 2008), 483-92.

62. Bostrom, *Superintelligence*, 36.

63. Vinge, "The Technological Singularity," 20.

64. For a critique of technology races, see Stuart Armstrong, Nick Bostrom, and Carl Shulman, "Racing to the Precipice: A Model of Artificial Intelligence Development," *AI & Society* 31, no. 2 (2016), 201-6; Allan Dafoe, "AI Governance: A Research Agenda" (Centre for the Governance of AI, Future of Humanity Institute, University of Oxford, 27 August 2018), https://www.fhi.ox.ac.uk/wp-content/uploads/GovAI-Agenda.pdf.

65. Apolline Taillandier, "From Boundless Expansion to Existential Threat: Transhumanists and Posthuman Imaginaries," in *Futures*, ed. Sandra Kemp and Jenny Andersson (Oxford: Oxford University Press, 2021), 333-48.

66. Stuart Russell, "Provably Beneficial Artificial Intelligence," in *The Next Step: Exponential Life* (Bilbao: OpenMind, 2017), 191.

to destabilize Western modern history's universalizing ambitions.[67] Simon has claimed that narratives of developmental continuity leading from humanity to posthumanity must be avoided. The challenge of making sense of the unprecedented is retaining the emancipatory potential of Enlightenment horizons of collective betterment and the critical power of postcolonial and feminist perspectives. In this sense, transhumanism finds itself at odds with "a global approach to politics without the myth of a global identity," such as that which has been promoted by Dipesh Chakrabarty.[68] At the same time, transhumanism turns technology into the main agent of change. By presenting "*a better-than-human being that is also other-than-human*," transhumanist technological projects enact a vision of posthumanity as "*humanity's temporal other*" that undermines the modern Western idea of history.[69] In this respect, transhumanism is best understood as part of a specific historical moment, one marked by the rise of an evental sense of historicity.

As this article demonstrates, however, transhumanism is also a highly ambiguous idea—at least, it is in terms of how its advocates have defined it. For instance, Bostrom has described transhumanism as a gradual process of awakening to new realms of experience and value. Defined in this way, transhumanism aims to update progressive hopes in the light of new technological possibilities.[70] According to Bostrom, technologies of "human enhancement" are the contemporary forms of a modern "quest to develop further."[71] Yet many transhumanists have argued that Western values of human improvement failed to be truly universal. For instance, transhumanist futurist F. M. Esfandiary harshly criticized the romanticization of suffering and nature as a flawed intellectual posture that often constitutes a disguised form of orientalism, or what he called the "doomsday chic of Western intellectuals."[72] To point out precisely how it is that transhumanist stories have only partly overcome universalist human history, it is necessary to examine the forms of knowledge and identity that would survive the transition to some unknown future. Transhumanists understand the human condition as a transitional stage, so they believe that some of its qualities are meant to be permanently overcome whereas others need to be carefully preserved.

These three conceptualizations of the posthuman future—the Promethean, the spontaneous, and the scalar—illustrate how transhumanist futures intertwine notions of utopia, dystopia, progress, and radical change in different ways. The posthuman is not conceived of as an entirely new era, even if realizing immortality and superintelligence would fundamentally alter the course of human history.

67. See, for example, Hava Tirosh-Samuelson and J. Benjamin Hurlbut, "Introduction: Technology, Utopianism and Eschatology," in Hurlbut and Tirosh-Samuelson, *Perfecting Human Futures*, 1-32; Zoltán Boldizsár Simon, "The Story of Humanity and the Challenge of Posthumanity," *History of the Human Sciences* 32, no. 2 (2019), 101-20.

68. Dipesh Chakrabarty, "The Climate of History: Four Theses," *Critical Inquiry* 35, no. 2 (2009), 222.

69. Simon, "The Story of Humanity and the Challenge of Posthumanity," 112, 113.

70. Bostrom described this process as exiting the "Platonic cave," where "our cognitive limitations may be confining us" ("Transhumanist Values," 6).

71. Nick Bostrom, "Human Genetic Enhancements: A Transhumanist Perspective," *Journal of Value Inquiry* 37, no. 4 (2003), 497, 496.

72. F. M. Esfandiary, *Optimism One*, 2nd ed. (Robbinsdale, MN: Fawcett Books, 1978), 11.

Rather, as Bostrom has argued, transhumanism represents the way toward a realm of reality, experience, scientific knowledge, and morality that is not yet accessible to humans.[73] In this sense, transhumanism is best understood as involving both continuous and discontinuous modes of historicity: the posthuman future is at once an unprecedented future and a development from past and present patterns of practices, values, and ideas. This point is evidenced by the three types of posthuman futures outlined above. In the Promethean future, unprecedented change would be brought about by an enlightened vanguard of individuals who are dedicated to expanding human capacities through self-transforming technologies, ranging from bodybuilding to psychoactive drugs. Continuity would be ensured by conserving personal identity, which is variously located in genetic material or in patterns of neuronal activity. In the spontaneous future, change would occur through the uncontrolled emergence of new life forms. However, decentralized social institutions would be sustained by shared norms of rationality and the continuous evolution of scientific public culture. In the scalar future, change would depend on the rationalizing power of AI, whereas continuity would result from the alignment of human values and AI decisions. In the three cases, historical change would involve some form of nonhuman agency; at the same time, it would remain inscribed within the story of humanity.

Whether they seek to preserve cryogenized bodies, to build a digital archive "as big as the earth" (to borrow Theodor H. Nelson's phrase), or to ensure that future generations actually come into existence with a sense of what makes life worthwhile, most transhumanists are as concerned with the past as they are with the future.[74] In transhumanist mailing lists and journals, special historical rubrics and calls to personal archives have expressed a sense of historicity, which transhumanists have understood as being manifested in the continuity of their own enterprise and that of individual identity through time. For this reason, posthuman futures have not altogether defied historical understanding. This fact has influenced transhumanist practices: many transhumanists believe that knowledge produced "with an eye toward future users" (including those in the remote future)—cryogenic and time capsules or digital archives, for instance—must be protected from future decay and from unprecedented technological breakthroughs.[75] Yet many also believe that some form of identity and the conditions for making sense of the world will remain essentially the same.

In transhumanism, visions of the truly other-than-human future usually stand in opposition to a desirable, more *humane* future in which the development of benevolent AI converges with forms of human enhancement or transformation. For instance, the roboticist Hans Moravec pointed out that conceiving of intelligent machines as humanity's "mind children" required looking into "a future which, from our present vantage point, is best described by the words

73. Bostrom, "Transhumanist Values," 4-5, 9.

74. See, respectively, Michael Perry, "Suspension Failures: The Dark Side of Cryonics History," *Cryonics* 13, no. 2 (1992), 5-8; Nelson, *Computer Lib/Dream Machines*, 141-48; Nick Bostrom, "Astronomical Waste: The Opportunity Cost of Delayed Technological Development," *Utilitas* 15, no. 3 (2003), 308-14.

75. On the relationship between archival practices and future users, see Lorraine Daston, "The Sciences of the Archive," *Osiris* 27, no. 1 (2012), 160.

'postbiological' or even 'supernatural.' It is a world in which the human race has been swept away by the tide of cultural change, usurped by its own artificial progeny."[76] At the same time, Moravec's "transmigration" scenario offered a pathway to human survival in a future in which "protein-based" intelligent lifeforms would be disadvantaged.[77] In this and less uncanny scenarios of posthuman future, the possibility of directing evolution or averting technological catastrophe is understood as taking part in a broader historical course—be it genealogical (as in the case of the Promethean future), evolutionary (as in the case of the spontaneous future), or accelerationist (as in the case of the scalar future).

SECURING THE COSMIC FUTURE: FUTURE EXPERTISE FOR NONHUMAN EPOCHS

Most transhumanist thought and practice is predicated on anticipating some form of "cosmic future," which requires departing from defining aspects of the human condition in its present form. In this sense, however, the posthuman can be comprehended from the point of view of a deep history of the universe. According to Ettinger, for instance, "if we take a sufficiently long view, [cryonics] is not so radical after all, but merely another incident in the cosmic drama."[78] The idea of a cosmic future is also a trope in popular science work on superintelligence, including in Moravec's idea of mind children and more recent accounts of existential risk mitigation. In Bostrom's oft-quoted words, the value of mitigating AI risk rests in "the attainment of a civilizational trajectory that leads to a compassionate and jubilant use of humanity's cosmic endowment," an achievement that he believes would likely be realized by the development of a desirable form of superintelligence.[79]

Stories of cosmic futures have their own histories.[80] In the 1970s, when technologies such as the computer or the spaceship seemed to redefine humankind's cosmological position, a rather common argument was that humanity's role in the cosmic drama would change as a result of its new technological powers. This was evident in the success of "synthetic" histories about the origin, deep past, and deep future of the universe as well as in attempts to bridge the gap between human and natural histories. Literary critic Ihab Hassan, who has been credited with introducing the contemporary critical terms "postmodern" and "posthuman," remarked in 1977 that humanity faced its "childhood's end," as the species was awakening to its isolation in the silence of the cosmos.[81] In this context, he proposed that a posthumanist culture would reconcile what C. P. Snow has

76. Hans Moravec, *Mind Children: The Future of Robot and Human Intelligence* (Cambridge, MA: Harvard University Press, 1988), 1.

77. Ibid., 108.

78. Ettinger, *The Prospect of Immortality*, 88.

79. Bostrom, *Superintelligence*, 260. See also Max Tegmark, *Life 3.0: Being Human in the Age of Artificial Intelligence* (New York: Knopf, 2017); Martin Rees, *On the Future: Prospects for Humanity* (Princeton: Princeton University Press, 2018).

80. Nasser Zakariya, *A Final Story: Science, Myth, and Beginnings* (Chicago: University of Chicago Press, 2017).

81. Ihab Hassan, "Prometheus as Performer: Toward a Posthumanist Culture?" *Georgia Review* 31, no. 4 (1977), 849. The term "childhood's end" is taken from the science fiction novel *Childhood's End* (1953) by Arthur C. Clarke.

termed the "two cultures" of science and the humanities.[82] Although such claims were hardly original, Hassan's engagement with transhumanism is notable. As he argued, Esfandiary missed the posthuman call by focusing exclusively on the importance of science and technology.[83]

Indeed, not all transhumanists have seen the need for a new universal narrative that would bridge humanist and scientific cultures. From transhumanist perspectives, history—as a specific realm of knowledge—does not make much sense. Most transhumanists, including Max More, have questioned the distinction between cultural and biological, or external and internal, change; to them, the term "nature" is largely devoid of meaning.[84] Similarly, visions of self-replicating nanotechnology and self-improving machine intelligence are predicated on a broad conception of life that blurs the boundary between organic and mechanical, social and physical. In this way, knowledge of the future can be acquired by investigating physical possibility. Transhumanists reject the pure distinctions between technology and humanity—and, relatedly, the notion that humanity and posthumanity should be approached as radically heterogeneous (after all, what we understand to be essentially human is only the product of our limited cognition). The very idea of a cosmic future brings to the fore the notion of nonhuman historical timescales and realms of comprehension, yet it also offers a way to use familiar terminology from physics, astrology, or evolutionary biology in order to make sense of radical change. In this respect, there is no need for a self-identical subject of transhumanist history. The posthuman story is that of life developing from primitive organisms to artificial minds—a process whose scale changes at the same time as the cognitive capacities of its protagonists.

However, locating transhumanism with respect to the "two cultures" is more complicated precisely because transhumanists have generally rejected this divide. Transhumanists have not only contemplated humanity's future destiny; they have also sought to bring it about by *humanizing technology*. In other words, they have made it so that even the most unfamiliar futures could be knowable. For Vinge, the notion of singularity encapsulated a difficulty shared by many science fiction writers: novels involving nonhuman perspectives and rapidly changing social and technological landscapes seemed condemned to irrelevance from their inception.[85] Drexler endorsed "exploratory engineering," a practical method for clarifying the limits of the scientifically possible, the technically achievable, and the socially desirable.[86] As he insisted (in a Popperian vein), this method promised scientific knowledge of the future that avoided the pitfalls of prediction. Similarly, AI future scenarios can be seen as intellectual devices for managing the radical uncertainty of the future: risk scenarios delimit a "region of possible

82. Ihab Hassan, "Beyond Arcadians & Technophiles: New Convergences in Culture?" *Massachusetts Review* 17, no. 1 (1976), 7. See also Ihab Hassan, "Toward a Transhumanized Earth: Imagination, Science, and Future," *Georgia Review* 32, no. 4 (1978), 777-95.

83. Hassan, "Beyond Arcadians & Technophiles," 9.

84. More, "The Extropian Principles 2.5."

85. Vinge, "Hurtling towards the Singularity," 117.

86. See, for instance, Drexler, *Engines of Creation*, 39-50; K. Eric Drexler, "Foresight Background No. 3, Rev. 1: Exploratory Engineering," *Foresight Institute* (blog), 1988, https://foresight.org/Updates/Background3.php#ExplorEng.

futures," wherein it is possible "to *manipulate* the future, steer it into a region palatable to humankind."[87] The challenge of existential risk, its advocates have argued, is to conceive rationally a future that one "cannot feel"; thus, resorting to stories is essential for conveying a sense of the potential loss that the failure to address these issues could entail.[88] More than a transformation from utopian dreams of possibility into dystopian discussions of risk and uncertainty, the transhumanist future of existential risk constitutes a reconceptualization of the posthuman future, one that moves from an apparently unlimited future space to a set of limited possibilities that can be rationally assessed and ranked. In this respect, stories of the cosmic future provide compelling images of what aspects of current human existence are at risk of being irremediably lost.

LIBERAL FUTURESCAPES

I suggest that transhumanism is best understood as a set of future visions crafted within liberal languages.[89] For transhumanists, the cosmic future is a valuable horizon, not because it sets final goals to humanity but because it opens a space for the realization of multiple forms of "transhuman transcendence."[90] In More's terms, change toward posthumanity will be led by those who "anticipate our future as posthumans, *and adjust their view of their lives accordingly*."[91] This highlights, as Sheila Jasanoff has pointed out, that transhumanism conveys high-modernist ambitions to turn human nature and societies into "liable" spaces open to intervention and rationalization, not through grand-scale social engineering but through a coordination of individual practices.[92] In general, transhumanist writers have portrayed decentralized forms of knowledge and technological practice as better suited to expressing the common good and enabling technoscientific innovation and coordination necessary for the development of some form of posthumanity. The Promethean future points to the self as the realm of free choice, safeguarded from outside coercion. In the spontaneous future, openness is primarily a condition for exercising property rights and enabling market efficiency: unlimited resources would alleviate economic and ecological contraction

87. Eliezer Yudkowsky, "Artificial Intelligence as a Positive and Negative Factor in Global Risk," in *Global Catastrophic Risks*, ed. Nick Bostrom and Milan M. Ćirković (Oxford: Oxford University Press, 2011), 316.

88. Eliezer Yudkowsky, "Cognitive Biases Potentially Affecting Judgement of Global Risks," in Bostrom and Ćirković, *Global Catastrophic Risks*, 115.

89. This is not to say that posthuman futures necessarily articulate liberal political ideas but that transhumanism has emerged as a particular way of making sense of change in liberal discursive contexts. On liberal languages, see Michael Freeden, *Liberal Languages: Ideological Imaginations and Twentieth-Century Progressive Thought* (Princeton: Princeton University Press, 2005). I follow the comprehensive definition of liberalism proposed by Duncan Bell in "What Is Liberalism?" *Political Theory* 42, no. 6 (2014), 682-715.

90. More, "On Becoming Posthuman."

91. Ibid. (emphasis added).

92. Sheila Jasanoff, "Perfecting the Human: Posthuman Imaginaries and Technologies of Reason," in Hurlbut and Tirosh-Samuelson, *Perfecting Human Futures*, 73-95. The notion of "high-modernism" as the project of rendering nature and society "liable" is taken from James C. Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed* (New Haven: Yale University Press, 1999), 29.

as well as the possibility of equilibrium between privately owned goods. The scalar future, by contrast, implies a long view from which technological risks and scenarios escape the realm of contestation. With enough time, any reasonable consensus could be achieved. Transhumanists turn the posthuman horizon into a manageable horizon, and they do so by claiming to ensure the "survival of life and liberty" in the long term.[93]

Going back to Shklar's idea of liberalism as a realist, yet hopeful and normative doctrine, it can be noted that transhumanists have insisted on describing their ideas as "realist" instead of utopian: they have claimed that theirs is "a philosophy of Optimism based on an open-ended future" as well as individual powers of imagination and sense of purpose.[94] In one of the few instances in which the posthuman future is referred to as a utopia, Bostrom insisted that "Utopia is not a location or a form of social organization" but rather "the hope that the scattered fragments of good that we come across from time to time in our lives can be put together, one day, to reveal the shape of a new kind of life."[95] The posthuman utopia Bostrom describes does not rely on any final visions or totalizing ideals; more importantly, it "breaks no law of nature."[96] This means that although openness and plurality are core values of transhumanist discourse, they in fact coexist with the singularity of a horizon foreclosed by the laws of physics, before which political and social dynamics are set as mere epiphenomena. Finally, transhumanists have envisioned liberal futures of very different sorts. This is best summarized by contrasting some of its sharpest expressions. On the one hand, Ettinger claimed in the mid-1960s that "there is no such thing as the state, no such thing as posterity: there are only individual people, and the living deserve as much consideration as the unborn."[97] No consideration of social justice or collective welfare should interfere with individual freedom, according to Ettinger. On the other hand, Bostrom argued in 2003 that a moral obligation to choose the best of futures derived from the potential "astronomical waste" of value for future generations that could be averted.[98] In this sense, disjunctions between various forms of liberal posthuman futures seem hard to reconcile for ideological analysis. Instead, they manifest how visions of radically alien life can be articulated with a defense not only of libertarianism but also of global and intergenerational welfare.

Transhumanist futures unfold in a complicated zone in which different forms of liberal historicity coexist; indeed, some forms are deeply entrenched in modern historicity, but others are open to the emergence of the unprecedented. This is where a closer inspection of the context of postwar American and Western European liberalism is useful. The long postwar period has been described as a moment that saw the shrinkage not of all futures but of progressive imaginaries to the benefit of liberal ones. Following Jenny Andersson, I situate the origin

93. Drexler, *Engines of Creation*, 172.

94. F. M. Esfandiary, *Up-Wingers: A Futurist Manifesto* (New York: John Day Company, 1973), 14.

95. Nick Bostrom, "Letter from Utopia," *Studies in Ethics, Law, and Technology* 2, no. 1 (2008), 6.

96. Ibid.

97. Ettinger, *The Prospect of Immortality*, 173.

98. Bostrom, "Astronomical Waste."

of liberal and critical notions of many worlds and futures in the postwar period rather than in the aftermath of WWI or in the crises of the 1970s.[99] In this view, the postwar period marked not the end of modern notions of history and future but the breaking up of the unity of progress and the remaking of forms of world unity and globality despite the fragmentation of common time. Visions of the posthuman future convey this notion that world change will occur through a change in the individual. As my exploration of transhumanism has suggested, subsequent remakings of humanity into one entity do not mean returning to the universalist ambitions of a modern, humanist type; instead, they introduce the fragmentation of liberal historicity into multiple conflicting temporal horizons. Finally, the various figures of the posthuman illustrate the pervasiveness of liberal normative repertoires throughout contemporary stories of unprecedented change.

CONCLUSION

In this article, I analyzed three distinct conceptualizations of the posthuman future, each of which is anchored in a specific technological project: the *Promethean future* of cryonics, the *spontaneous future* of nanotechnology, and the *scalar future* of superintelligence. I highlighted how transhumanism involves conceptions of continuity and discontinuity but also more complex notions of universalism than its critics have tended to suggest. In particular, the universality of the posthuman future stems from the intangible character of the law of physics rather than from a common human nature. I also explained how transhumanists have anchored collective progress in projections of a future liberal world order that would depend not on representative or dialogical politics but on the aggregation of individual interests or values. Despite notable differences, they have generally understood their projects as focusing on opening time to a multiplicity of individual paths: the posthuman future would result from a particular conjunction of individual interests in a world that has vastly extended both in space and time.

This article has historicized the experience of discontinuous times. Transhumanists incorporate the challenge of nonhuman history by drawing continuity and disjointing time in different ways. In the material studied here, posthuman realization (individual or collective) occurs after—but not beyond—the confines of what has hitherto defined human history: physical decay, material scarcity, or irrationality. How transhumanists have understood the era of posthumanity expresses at once the search for a figuration of radical otherness and the affirmation of a universal course, not through history but through physics and biology. As I argued in this article, the occurrence of unprecedented change toward posthumanity depends not only on social and intellectual dispositions that have to be cultivated in humans but also on the advent of a particular cosmic event (such as the rise of intelligent nonhuman life). At the same time, the plurality of transhumanist futures manifests the wide-ranging appropriation of horizons of unprecedented change within postwar liberal normative repertoires.

99. Jenny Andersson, *The Future of the World: Futurology, Futurists, and the Struggle for the Post-Cold War Imagination* (Oxford: Oxford University Press, 2018).

As Lorraine Daston has argued, current concerns for the nonhuman say much less about the nonhuman than they do about contemporary understandings of human knowledge and its limits.[100] Transhumanist posthuman futures are striking in that they anticipate the unprecedented without necessarily invoking the Anthropocene event, though they discuss human historical responsibility toward the future and world system equilibrium. Nonetheless, they illustrate some of the very important challenges of nonhuman times. Indeed, because they manifest how ideas about radically alien life can coexist with a defense of existing modes of human existence, values, and power relations, transhumanist futures offer useful insights into the political possibilities and limits against which nonhuman futures can be deployed.

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100. Lorraine Daston, "Intelligences: Angelic, Animal, Human," in *Thinking with Animals: New Perspectives on Anthropomorphism*, ed. Lorraine Daston and Gregg Mitman (New York: Columbia University Press, 2005), 37-58.